

The transboundary displacement of deforestation under REDD+ : Problematic intersections between the trade of forest-risk commodities and land grabbing in the Mekong region



Micah L. Ingalls^{a,*}, Patrick Meyfroidt^{b,c}, Phuc Xuan To^{d,e}, Miles Kenney-Lazar^f, Michael Epprecht^a

^a Centre for Development and Environment, University of Bern, Switzerland

^b Earth and Life Institute, Université catholique de Louvain, 1348, Louvain-la-Neuve, Belgium

^c F.R.S. - FNRS, 1000, Brussels, Belgium

^d Crawford School of Public Policy, Australia National University, Australia

^e Forest Trends, Washington D.C., United States

^f Hakubi Center for Advanced Research and Center for Southeast Asian Studies, Kyoto University, Japan

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ABSTRACT

A key lever to mitigate global climate change is the reversal of forest carbon emissions trends throughout the Global South. Reduced Emissions from Deforestation and Forest Degradation (REDD+) initiatives seek to conserve forest carbon stocks primarily through national and sub-national policies and interventions. Dominant drivers of forest change are, however, increasingly international in scope, tied to global commodity markets and investment flows, and are not easily captured or effectively addressed through nation-based carbon accounting. The fragmentary adoption of REDD+ across forest nations leaves room for the displacement of deforestation from early-adopters and countries with more rigorous carbon-related regulatory regimes to late-adopters of REDD+. While this displacement is expected to be substantial, our empirical understanding of the causal pathways of transboundary displacement remains weak. Our research addresses this lacuna, focusing on Vietnam, an early adopter of REDD+ that has experienced significant reforestation despite exponential growth in exports of key forest-risk commodities, sourced in large part from Lao PDR and Cambodia. We show that over the last decade, the trade of forest-risk commodities was large and accelerating in the Mekong region, concurrent with the rapid expansion of large-scale land acquisitions (LSLAs), constituting important, inter-related causal pathways for the displacement of deforestation and forest degradation. LSLAs are, however, core of national economic development strategies in the Mekong region, indicating a problematic relationship between REDD+, trade flows and land and forest governance. We explore the problematic intersection between these dynamic processes, their impacts on forests in Lao PDR and Cambodia, and implications for global efforts to manage forest resources and reduce emissions. The inability of REDD+ to address transboundary impacts suggests the need for complementary interventions that address supply- and demand-side dynamics.

1. Introduction

Due to the critical role of forest as potential sinks and sources of carbon, the finalization of the Reduced Emissions from Deforestation and Forest Degradation (REDD+) Framework was a key achievement of the Paris Agreement in December 2015. Results-based Payments (RBPs) are expected to increasingly constitute the core financing mechanism of REDD+, incentivizing the achievement of Nationally-Determined Contributions (NDCs) to reducing forest carbon emissions and enhancing removals of atmospheric carbon (Wong et al., 2016). Whatever its aspirations, the significance of REDD+ rests on its

effectiveness in practice—in particular, its ability to address forest carbon emissions not only at the local level, but also aggregate global emissions (Dwyer, 2015). While some countries have moved quickly toward the achievement of various REDD+ readiness benchmarks in the development of National REDD+ Programs, others have been slow, uncommitted or non-participating. This fragmentary rolling out has important implications across forest nations and intersects problematically with drivers of deforestation and forest degradation, which are increasingly globalized in nature and dominated by forest-risk commodity sectors (those that commonly impact forest through, for example, forest conversion for agriculture or forest degradation through

* Corresponding author.

E-mail address: micah.ingalls@cde.unibe.ch (M.L. Ingalls).

timber extraction) that easily shift from one place of production to another (Meyfroidt and Lambin, 2009; Henders and Ostwald, 2014). The role of global supply chains in driving forest change is not only substantial, but accelerating (Liao et al., 2016) and increasingly tied to Foreign-Direct Investment (FDI) through large-scale land acquisitions, or LSLAs (McMichael, 2013). Particularly since the food and energy crisis of 2007–2008, investor countries have turned to LSLAs as mechanisms through which to bypass market intermediaries to secure resources for import (Zoomers, 2010), while also finding more stable investment options in land, avoiding restrictive domestic regulatory environments and resource scarcity (Keene et al., 2015). LSLAs are often characterized as land grabs—acquisitions of land characterized by intransparency, ignoring fundamental rights of local communities and entailing substantial social and environmental impacts (Nally, 2015). But this is not always the case. LSLAs vary in character and are often seen as licit, particularly where they contribute to (or are perceived to contribute to) national development goals in recipient countries by providing investment capital, labor options, and royalties to finance state treasuries (White et al., 2012) and thus do not always fit the mold implied by the ‘land grab’ pejorative (Wolford et al., 2013). The production of agricultural commodities for export through LSLAs and other market and trade dynamics has played an increasingly dominant role in driving deforestation (Hosonuma et al., 2012) as companies often seek new lands for investment and commodity sources in countries where environmental regulations are comparatively lax (Le Polain de Waroux et al., 2016). International commodity flows for four products (wood, beef, soybean and palm oil) from seven countries alone accounted for up to 40% of global deforestation (Henders et al., 2015) with, in several cases in South America and Asia, for example, forests supplying as much as 89% of land for commodity crop expansion (Meyfroidt et al., 2014).

The pace and magnitude of these resource flows is thus directly implicated in the transboundary displacement of forest pressures and associated emissions. The fragmentary and uncoordinated adoption of REDD+ across countries raises important questions regarding the risks of transboundary displacement of deforestation and forest degradation from early adopters and countries with strong regulatory control and advanced participation in REDD+ to carbon-unregulated countries. International leakage (or ‘spillage,’ the transboundary displacement of carbon emissions caused by policies aimed at reducing carbon emissions, IPCC, 2007) from industry has received some attention (Kuik, 2014). Policy makers have, however, paid comparatively little attention to transboundary leakage in other sectors (Henders et al., 2015; González-Eguino et al., 2016). Fairly rigorous methods and standards of accounting for sub-national leakage have been developed and rolled out over the past decade through REDD+ pilot initiatives, but these have, in the main, not been applied across international borders. This is intentional and explicit in the structure of the United Nations Framework Convention on Climate Change (UNFCCC). Nested within this, the assumption of the REDD+ Framework is that all emissions will eventually be accounted for and dealt with once REDD+ achieves global saturation across countries. In short, responsibility for reducing forest carbon emissions and enhancing removals—the basis of RBP-based incentives—begin and ends within national borders (Branger and Quirion, 2014). The potential incompatibility between increasingly globalized resource flows and nationalized, disconnected application of REDD+ interventions presents a substantial, structural limitation in the way REDD+ is framed with direct implications for the question of whether REDD+ can achieve climate change mitigation at the global-level. Terrestrial leakage—related largely to land use conversion for commodity supply chains—may constitute the dominant type of leakage up to 2050 due to deforestation in weak, slow or non-participating REDD+ countries (González-Eguino et al., 2016).

To date, displacement studies have highlighted the complex relations and feedbacks between forest cover changes, international trade flows and policies (Jadin et al., 2016a,b). These studies highlight that

the geographic displacement of pressure on forests can occur either through the movements of agents responsible for land use change and deforestation, or through increased trade of agricultural and forestry products, and result from a broad range of causal factors. These studies also highlight the challenges to attribute this displacement (i.e. to quantify which share of the displacement can be considered as leakage in the strict sense) specifically to policies aimed at conserving forests or mitigating carbon emissions (Meyfroidt and Lambin, 2009; Meyfroidt et al., 2013a,b). Indeed, leakage studies have struggled to demonstrate the (typically complex and multivariate) causal links between international commodity flows and forest-change impacts within specific national contexts or to adequately interrogate the ways in which these articulate with local structural dynamics (Meyfroidt and Lambin, 2009; Kastner et al., 2011; Henders and Ostwald, 2014; Meyfroidt, 2016). There is an urgent need for further analysis of the causal mechanisms through which displacement leads to deforestation in order to provide a substantive, evidentiary basis for reforming land and forest governance and policy initiatives such as REDD+, and situating these initiatives within broader concerns related to LSLAs and the role these play in national development trajectories.

The Mekong region—especially the closely-interconnected economies of Cambodia, Lao PDR (or Laos) and Vietnam—presents a striking case for the displacement of deforestation and forest degradation (Meyfroidt et al., 2010). Amid a regional pattern of deforestation and rapid land use change, Vietnam has stood out as exemplary of a limited set of countries that have been able to negotiate the transition from deforestation to reforestation while also achieving substantial economic growth and the rapid expansion of forest- and land-intensive commodity sectors (see also Jadin et al., 2016a on similar dynamics in Costa Rica). Following the adoption of *Doi Moi* economic reforms in 1986, Vietnam experienced robust economic growth averaging around 7% per year (CEBR, 2015). Central to this impressive economic growth has been Vietnam’s rapid expansion of commodity exports and burgeoning trade relationships including the ASEAN Free Trade Area in 1995, the Asian-Pacific Economic Cooperation in 1998, the ASEAN-China FTA in 2002, the World Trade Organization in 2007 and, most recently, participation in the formation of the ASEAN Economic Community. These have opened large markets for Vietnamese exports, which have grown rapidly with 13.8% year-on-year growth (in 2010 US-Dollar constant) between 2000 and 2016 (World Bank, 2017).

Vietnam has steered an uncertain path between this rapid, export-oriented growth and a demonstrated commitment to forest resource conservation. Since the country’s independence in 1954, the state has played a dominant role in the administration of land and forest resources, navigating between the often contested interests of the state and state-owned enterprises (SOEs), the private sector and a local communities (To et al., 2015; McElwee, 2016). During the early years, the national forest estate was largely regulated through State Forest Enterprises (now State Forest Companies, or SFCs) that leveraged timber resources to secure development aims and hard currency from timber export. Logging peaked at the end of the 1980s, when annual harvest reached about 1 million m³, rapidly depleting national forest reserves. Timber extraction, together with agricultural conversion, reduced Vietnam’s forest area to less than 9 million hectares (ha) or 28% of total land area (Nguyen, 2001).

An important shift occurred during the early 1990s as the government of Vietnam, with substantial technical and financial backing from international organizations, began to prioritize forest conservation through a suite of policy reforms, investment programs and improved regulatory oversight aimed at enhancing the forest estate, reallocating a portion of state land to households, and restricting land use conversion. In 1993, the government issued a logging ban in special-use forests (conservation areas and reserves) and, in 1998, extended this ban to cover more than half of Vietnam’s forest estate, with substantial reductions in national logging quotas in remaining forest areas (Pham et al., 2012). Reforestation efforts through commercial plantations were

also undertaken, beginning with Program 327 (or Greening the Barren Hills) followed by Program 661 (or the 5 Million ha Reforestation Program, 5MHRP) (McElwee, 2016), accompanied by the progressive devolution of land to smallholders in order to address public concerns relating to land tenure insecurity and in an effort to incentivize reforestation through small-scale tree plantation, contributing 60% of the country's annual increase of approximately 200,000 ha during the following decade (To et al., 2015). These efforts, together with structural changes in Vietnam's agricultural sector, resulted in the rapid expansion of forest land (increasingly comprising of plantations), reductions in timber available for the wood processing sector and significant restrictions on land availability for private sector firms seeking large-scale investments (Sikor, 2012). Vietnam transitioned from a deforesting- to a reforesting-nation between 1990 and 1995 (Meyfroidt and Lambin, 2009, 2008). By 2015, forest cover reached nearly 14 million hectares, or 40.8% of total land area, though not necessarily with high quality or density (To et al., 2015; MARD, 2016). More recently, Vietnam has sought to leverage these achievements and further expand benefit from its forest resources through REDD+ initiatives, becoming one of the first countries to initiate activities under the World Bank's Forest Carbon Partnership Fund (FCPF) and the United Nations Collaborative Program on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD). These initiatives have placed Vietnam in good standing within global REDD+ programs, attracting more than US\$214 million in REDD+ related financing since 2009 (TRD, 2017). Representative of its objective to combine export-oriented growth with preservation of its forest resource, Vietnam entered a provisional Voluntary Partnership Agreement (VPA) of the European Union (EU) Forest Legality Enforcement Governance and Trade (FLEGT) program in 2017 to restrict illegal logging and ensure preferential access to EU wood markets.

Alongside increased forest cover, rapid economic growth has focused in large part on its land- and forest-intensive sectors. Today, according to UN Comtrade Data, Vietnam's wood processing and export sector comprises around 2% of its GDP and has expanded rapidly. In 2013, with a total value of wood exports around US\$ 6.2 billion, Vietnam became the largest exporter of wood products in ASEAN, second largest in Asia, and sixth in the world. By 2015 these exports had grown to US\$ 7.14 billion (an annual growth rate of 8%), comprising the fifth-largest foreign-exchange earning sector in Vietnam's economy. Similar growth has been seen in agricultural sector—wherein, for example, Vietnam ranks as the second largest global exporter of both cassava and coffee. The rubber boom in the early 2000s led to the similarly rapid production and export of rubber. In 2015, Vietnam exported US\$ 1.5 billion in latex, primarily to China and in rubber, becoming the third largest global exporter of natural rubber (Hoa, 2016).

Vietnam's ability to at once secure and increase its forest estate while achieving unprecedented expansion of land- and forest-risk commodity sectors hinges on its importation of raw and semi-processed materials from abroad, representing a substantial displacement of deforestation and forest degradation to source countries. According to Meyfroidt and Lambin (2009) an estimated 39% of Vietnam's reforestation over transition period, 1987–2006, was attributable to the displacement of deforestation to source countries supplying Vietnam's processing and export sectors. Toward the end of this transition period the pace of displacement was accelerating: in 2006, they estimated that 71.4% of forest regrowth could not have occurred in the absence of key imports. The lack of wood resources (particularly large-diameter timber) and land scarcity due in large part to restrictive national land and forest policies and a lack of political and public support (in light of persistent land shortages for smallholders) for allocating large-tracts of land to companies (Sikor, 2012) have increasingly pushed Vietnamese investors and businesses (both state owned enterprises and private sector firms) to look abroad, often with direct financing from the State Bank of Vietnam and the Bank for Investment and Development of

Vietnam. While their trade and investment networks are increasingly global in nature, direct impacts have been most pronounced in the geographically-proximate countries of Lao PDR and Cambodia (Meyfroidt and Lambin, 2009; Wells-Dang and Long, 2016).

Lao PDR and Cambodia, though similarly demonstrating considerable economic growth over the past decades (due in large part to exports to Vietnam, but also other countries including China and Thailand) have, by contrast, lagged considerably behind Vietnam in benchmarking REDD+ progress and addressing deforestation from agricultural conversion or forest degradation from (often illegal) timber extraction. Lao PDR's forest cover steadily declined between 1982 and 2010 at an average annual rate of 0.3%, with even higher deforestation rates in provinces adjacent to the Vietnam border (Lestrelin et al., 2013). In 2010, the Government of Lao PDR estimated forest cover to be around 9.5 million ha, or 40.3% of total land area. From 2010 to 2015, official figures indicate an increase in forest area (FIPD, 2015), though these increases were largely attributable to the expansion of commercial tree plantations, especially rubber (FAO 2015). Despite these modest advances, Lao PDR's Readiness Preparation Proposal (or R-PP, GoL, 2010) estimates that due to the expansion of commercial plantations and other land-based investments, the country will lose around 67,000 ha of forests per year through 2020.

Cambodia had the third highest deforestation rate in the world between 2005 and 2010 (FAO, 2010) and the highest rate in tree cover loss in Asia for the period 2000–2012 (Hansen et al., 2013). The 2015 Forest Resources Assessment data indicates that Cambodia's forest areas total 9.46 million ha, or 52% of total land area, down from 12.9 million ha or 71.5% in 1990 (FAO, 2015). In both Lao PDR and Cambodia, the conversion of forests through large-scale land transfers and commercial investments in forest-risk commodities comprise the principal drivers of deforestation, while forest degradation is largely attributed to unsustainable and illegal logging (GoL, 2010; GoC, 2011).

While the expansion of commercial agriculture and forestry plantations, FDI-related LSLAs and logging for wood exports figure prominently as drivers of forest carbon emissions, these sectors also form the basic engines of economic growth and are thus core to national development strategies—even as the effectiveness and legality of these investments and trade flows are increasingly brought into question (Global Witness, 2013; Davis et al., 2015; Hett et al., 2015). These complexities raise important questions concerning our understanding of trade-related transboundary displacement of drivers of pressure on forest and the causal mechanisms of these, but also the problematic intersections with development pathways in the Mekong. In this paper, we address these questions by arguing that the trade of forest-risk commodities and FDI-related LSLAs are not only key—and closely related—causal pathways in the transboundary displacement of deforestation and forest degradation that highlight the potential limitations of REDD+, but also exhibit a problematic relationship with national development aspirations that are not easily addressed. This comes at a critical time, as the impacts of REDD+ for forest conservation in Vietnam are only beginning to emerge—we thus anticipate the implications of its full application in practice. We demonstrate that the production of deforesting commodities has moved from Vietnam to Lao PDR and Cambodia in part by way of economic land concessions granted by their governments to Vietnamese companies. These concessions overlap with substantial areas of forested lands, showing how forest loss has crossed national borders in the Mekong while comprehensive REDD+ programs have not.

In this paper we: (1) explore trade dynamics of key forest-risk commodities—timber and semi-processed wood products, rubber latex, agricultural and mining products—from Cambodia and Lao PDR to Vietnam, (2) explore trends in related Vietnamese LSLAs in Lao PDR and Cambodia and the role these play as core development strategies, (3) explore the causal pathways through which trade flows and concessions impact directly on forests, illustrated through two case studies and, lastly, (4) discuss the implications for REDD+ and its problematic

intersections with national development strategies, efforts to address illegal timber flows, discourses surrounding land and forest governance and the increasingly shrill debate on land grabbing in the Mekong.

2. Methods

To analyze trade flows between Lao PDR and Cambodia to Vietnam for timber and semi-processed wood products, rubber latex, and agricultural and mining exports we use trade data from UN Comtrade for the period 2007–2016¹, supplemented by data provided by the Vietnam Customs Department and other published sources (as referenced) to address data gaps and corroborate key trends. Absent of volume data (a more reliable measure for trade, given under-reporting of values) for Vietnam wood imports before 2012, the value of imports (in USD) are used to characterize trade trends. In Lao PDR, we characterized trends in Vietnamese land investments by drawing on data produced through concession inventory mapping at national- and sub-national levels in collaboration with an inter-ministerial task force established by the Office of the Prime Minister, with support from the Center for Development and Environment (CDE) at the University of Bern. In Cambodia, (except where noted) we draw on land concession data available from Open Development Cambodia² (ODC), whose data derive from government data on Economic Land Concessions (ELCs) disclosed in 2012, supplemented by data subsequently acquired from project documents and field-investigations. We highlight two prominent cases in Lao PDR and Cambodia to elaborate specific, local causal relations between large-scale concessions and forest loss, drawing on recent surveys carried out under CDE in Lao PDR and data from ODC and the Wildlife Conservation Society (WCS) in Cambodia, assessing forest cover change through manual classification of high-resolution satellite imagery for periods before, during and after concession approval and implementation. The policy implications of these analyses for REDD+, EU-FLEGT, and national reforms in Lao PDR and Cambodia draw on published reports and other analyses as referenced.

3. Results

3.1. Dynamics of trade in land- and forest-risk commodities

3.1.1. Trade in timber and semi-processed wood sector

The displacement of deforestation from Vietnam to Cambodia and Lao PDR is related in part to the increase in the import of timber and semi-processed wood products that have burgeoned over the past several years. While the import profile of Vietnam's wood processing industry is highly complex—Involving imports from more than 100 countries—Lao PDR and Cambodia constitute the largest per-country sources. In 2015, for example, import of logs and sawnwood from Lao PDR and Cambodia comprised 23.1% and 15.8% of Vietnam's total import, respectively (To et al., 2016).

Between 2007 and 2014 the total value of wood exports from Lao PDR to Vietnam showed a year-by-year average increase of 33%, totaling USD 2.2 billion by the end of that period (Fig. 1). While official trade volumes are not available prior to 2012, value data over available years reflects this trend, with an average annual increase in trade volume of over 29%. Vietnam's wood imports from Cambodia reflect a similar but more pronounced trend, with an annual increase in trade value and volume of over 58% between 2007–2014 and 86% between 2012–2014, respectively.

During the period 2014–2015, an important trade shift occurred due to political changes in Lao PDR and, secondarily, in Cambodia, which are discussed in depth below. In 2015, timber exports from Lao PDR to

Vietnam began to drop precipitously. The total volume of imported Lao timber declined by 14% in 2015 and a further 80% in 2016, to a mere 174,861 m³ RWE. Concurrently, however, Cambodia's wood exports increased exponentially during both 2014 (199%) and 2015 (172%), but declined considerably (42%) in 2016 following renewed efforts to clamp down in illegal cross-border trade. While our primary reference frame covers the period 2007–2016, data from Vietnam Customs in 2017—showing 544,841 m³ RWE, a 44% increase in imports over the previous year—suggests this downturn in imports from Cambodia was short-lived. Reports indicated, for example, that Vietnamese companies in Gia Lai Province had been granted 300,000 m³ in illegal timber concessions in 2017 (EIA, 2017).

These figures are conservative, as official trade data is not able to capture those additional illegal wood imports that were never reported by Vietnam Customs. Between 1987 and 2006, Meyfroidt and Lambin (2009) estimated that more than 48% of total wood imports were illegal and both the volume and proportion of illegal imports were steadily rising. Smirnov's (2015) study of trade between Lao PDR's southern provinces and Vietnam similarly indicated that more than 50% of timber was from undocumented sources, in addition to timber derived from illegal and semi-legal (but recorded) sources. It is similarly difficult to establish the legality of Cambodian timber. Since 2002, no national logging quotas have been issued, pushing timber extraction pressures onto protected forest areas for which a substantive case for legality is hard—maybe impossible—to make (Forest Trends, 2015). Given this, it is difficult to credibly establish the legal basis for nearly all imports of timber from Cambodian sources. Recently, To et al. (2017) estimated that 50–70% of wood imports into Vietnam from Lao PDR and Cambodia comprised of species with high risk of illegality.

3.1.2. Trade from rubber, agriculture and mining sectors

The rapid growth in exports of (non-wood) forest-risk commodities (from rubber, agriculture and mining sector) from Lao PDR and Cambodia to Vietnam over the decade also plays a role in deforestation displacement. The composition of total exports (by value) over the 10-year period in Lao PDR were dominated by mining-sector exports, which comprised 61.7%, while Cambodia agricultural exports were dominant, comprising 64.4%. Lao and Cambodia exports to Vietnam grew by 112% and 297%, respectively (Fig. 1), though with significant variations in inter-annual imports and growth across sectors. The highest annual growth intervals for total exports to Vietnam in these three sectors were seen between 2015 and 2016 for Lao PDR (56.6% annual growth, primarily due to growth in the value of mining-sector exports) and, in Cambodia, between 2010 and 2011 (68.8% annual growth, primarily due to growth in the value of agriculture-sector exports). Sectoral growth trends also varied substantially (below).

Vietnam is the third largest global exporter of natural rubber. While Vietnamese domestic rubber production remains high, it faces increasing land scarcity both in biophysical terms as well as scarcity induced by domestic policies restricting access to land. The Vietnamese rubber sector has thus increasingly turned to plantation expansion in Cambodia and Lao PDR (Kenney-Lazar, 2012) and the import of latex. Between 2007 and 2016, according to UN Comtrade data, the value of natural rubber latex imports from Lao PDR grew exponentially, increasing 100-fold during the ten year period with 176.3% average annual growth. Imports from Cambodia were much larger (totaling over USD1 billion in 2016), but grew at a much slower rate, a mere 8.5% per year, possibly due to the late start (since 2010—see, for example, Case 2 below) of new rubber plantation expansion which started producing latex only as early as 2017. Price fluctuations and trade volatility, however, were high, with 2016 import values less than half of those of 2011.

Vietnam is the world's second largest exporter of cassava and coffee, as well as an important exporter of other agricultural products. As for rubber, these exports comprised both domestic product and imports from Lao PDR and Cambodia, as well as other countries. Vietnamese

¹ All wood trade data referenced in the text up until 2016 was from UN Comtrade, except where noted.

² Online: <https://opendevcambodia.net/>

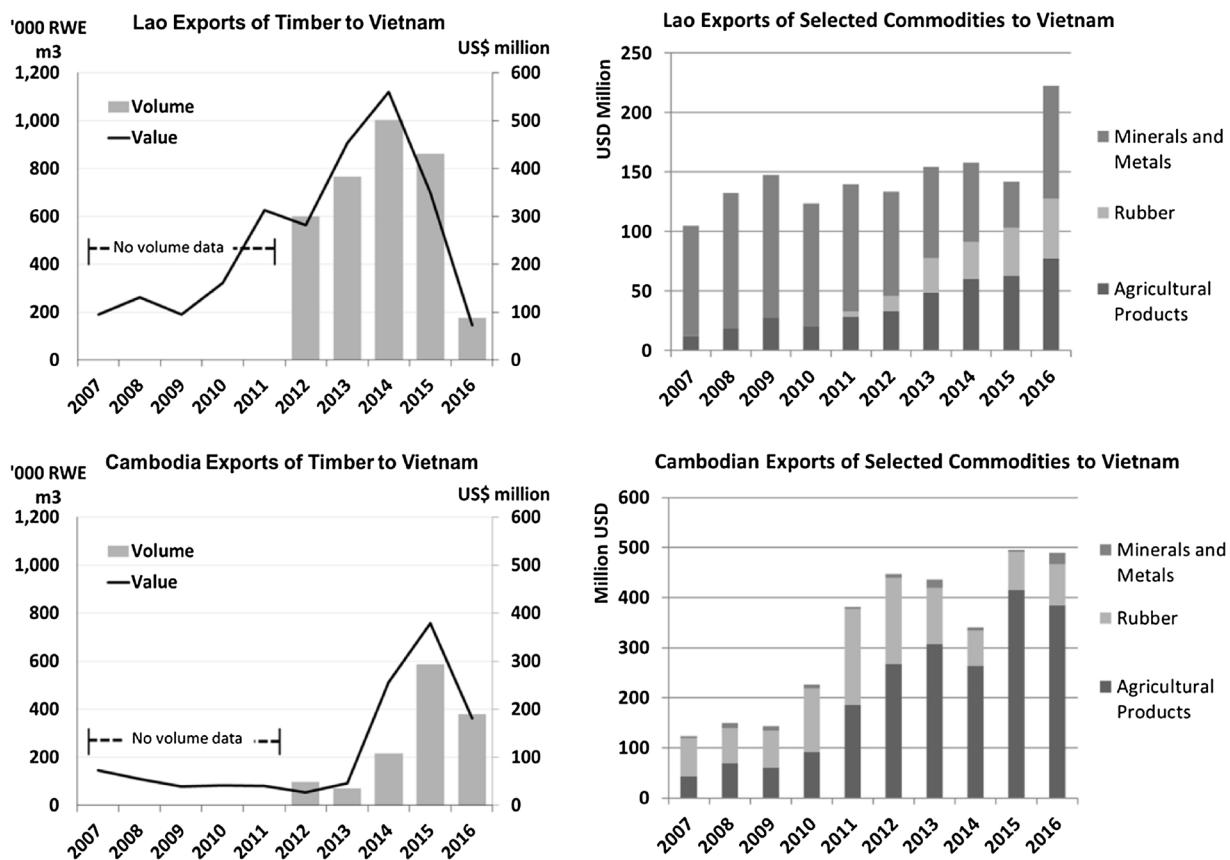


Fig. 1. Vietnamese Imports of Forest-Risk Commodities from Lao PDR and Cambodia (2007–2016).

Sources: UN Comtrade Date (2007–2016) and Vietnam Customs

agricultural imports from Lao PDR grew 5-fold between 2007 and 2016, with average annual growth of 25.5%. Imports of agricultural products from Cambodia grew more rapidly than from Lao PDR, seeing an 8-fold increase since 2007, with average annual growth of 33.1%.

Vietnam's mineral sector—the third largest in Southeast Asia—is dominated by Vietnam Coal and Minerals Industries Company, VINACOM. This state-owned company has extensive domestic and international holdings, including through its subsidiary companies Vinacom-Lao Ltd. and Alumina Cambodia Ltd, with plans to further extend its mining operations in Lao PDR and Cambodia³. Vietnam's respective imports of mining-sector products from Lao PDR and Cambodia vary significantly. While imports from Lao PDR dwarf imports from Cambodia, these grew only marginally (3%) between 2007–2016. Imports from Cambodia increased 5-fold during the same period, seeing an average annual increase of 75.3% increase.

3.2. LSLAs as a causal mechanism for displacement of deforestation and forest degradation

Lao PDR and Cambodia have aggressively pursued a model of economic growth through export-oriented FDI and a heavy reliance on the primary sectors of forestry, agriculture, hydropower and mining in an effort to promote national development, eradicate poverty and achieve other socioeconomic goals (Forest Trends, 2014). While foreign investments in land and forest resources have occurred since at least the 1970s, recent years have seen the rapid expansion of such investments through such policy platforms as Lao PDR's Turning land Into Capital (TLIC) policies (UNDP, 2010; Baird, 2011) and similar initiatives in

Cambodia (Ullenberg, 2009; Diepart, 2015; Dwyer and Ingalls, 2015). LSLAs through state-sponsored concessions have expanded over the past ten years at a startling pace, constituting an important causal pathway linking the trade of forest-risk commodity exports and the displacement of deforestation and forest degradation from Vietnam.

During the years 2010–2014, government figures indicate that FDI in Lao PDR grew at an average rate of 47.4% per year (MPI, 2015). Lao PDR is the largest single destination for Vietnam's outgoing investments (Wells-Dang and Long, 2016). Of Vietnam's total investments of US\$ 4.9 billion across all sectors, more than US\$ 1 billion was in agriculture and forestry projects. Total land-investments through concessions cover 1.2 million ha of land, with a further 10.2 million hectares granted for mineral and natural gas exploration. Of implementation (versus exploration) concessions, Vietnamese and Vietnamese Joint Venture investments (both private sector and SOEs) hold the second-largest per-country share, with 141,527 ha, growing since 2004 at an average annual rate of 93.7%. Of these concessions, rubber dominates with 75.3% (106,537 ha) of total area, with a further 17.8% (6667 ha) in agriculture (principally coffee and cassava), 4.7% (6667 ha) in mining and a 0.8% (1101 ha) for hydropower power stations. In addition to these concessions for direct implementation, Vietnam has been granted a further 603,615 ha for mining exploration. While mineral exploration areas are large, direct forest impacts are, in principle, limited to clearance for sampling and the development of access roads.

The situation in Cambodia is similar but much more pronounced. Official data indicates that 1.2 million ha have been granted in ELCs (ODC data). Independent studies suggest that the actual number is much higher. Forest Trends (2015), estimated that between 2004 and 2013, the area under ELCs expanded at an average rate of 208,141 ha per year totaling as much as 2.6 million hectares, equivalent to 14% of total land area by 2013.

³ <http://www.vinacomin.vn/introduction/main-area-of-operation-201507151619332707.htm>

FDI in Cambodia in 2015 totaled USD 4.6 billion increasing at an average rate of 19.5% per year since 2012 (CDC, 2016; Oxfam, 2016). In 2016, 70.2% of total Vietnamese FDI was invested in the agricultural and forestry sector primarily in economic land concessions for rubber plantations. According to data available from ODC (2016), land concessions to Vietnamese and Vietnam Joint Venture companies expanded exponentially since 2005, growing at an average annual rate of 454.3%. As in Lao PDR, Vietnamese concession area is dominated by rubber, which comprises at least 60.2% (or 244,611 ha), followed by mining concessions (30.7%, or 124,683 ha). These figures are conservative and data discrepancies abound. Some studies suggest that actual holdings may be much larger. A detailed assessment of Landsat 8 imagery from 2013 and 2014 carried out by the World Resources Institute (Petersen et al., 2016), supplemented with very-high resolution (sub-meter) imagery⁴ estimated a total of 914,600 ha (5% of total land area) of commercial tree plantations in Cambodia, 94% of which are rubber. Petersen et al. (2016) estimate current concession holdings in rubber by Vietnamese firms to be around 405,300 ha.

These concessions constitute not only key sources for export-oriented rubber, agriculture and mining commodities, but also important sources of timber for Vietnam's wood processing industry (EIA, 2012; Forest Trends, 2015; Petersen et al., 2016). Timber sourcing occurs in both direct and indirect ways. While some part of timber exports are sourced through land conversion, concession projects also provide the opportunities and legitimacy for extensive clearance and selective logging far outside of concessions, often within protected areas where substantial reserves of high-value timber remain (Smirnov, 2015; EIA, 2017). According to concession inventory data produced with support from CDE, at least 12.5% (17,657 ha) of Vietnamese concession land (for implementation) and 79.2% (481,202 ha) of mineral exploration concessions fall within state forest lands. In addition to these, an unknown number also fall within forests outside of the national forest estate (see HAGL case below). According to ODC data (2016) in Cambodia, nearly 80% of all concession areas fall within the national forest estate, wherein the overall deforestation rate within these concessions was 31.8% higher than in comparable land outside the concessions (Davis et al., 2015).

LSLAs through state-granted concessions have fallen under increasing scrutiny in Lao PDR in Cambodia, as civil society actors and government agencies increasingly question the benefits these bring to local communities and the national economy. In 2012, the Prime Minister of Lao PDR issued a selective moratorium (Prime Minister Order 13) on new concessions for rubber, eucalypts and some minerals. Similarly, the Cambodia issued a partial cancellation of non-performing ELCs and a moratorium on new concessions (Prime Minister Order 01) that same year, pending official review.

3.3. Exploring local causal mechanisms: the cases of HAGL in Lao PDR and VRG in Cambodia

In order to elaborate the relationship between these national-level trade flows and the local mechanisms of expansion of LSLAs and displacement of deforestation and forest degradation, we examine below two prominent cases of HAGL in Lao PDR and VRG in Cambodia (Fig. 2), both located within the so-called Cambodia-Lao-Vietnam (CLV) Development Triangle (Nguyen, 2012; Dwyer, 2015). These companies represent the largest individual rubber investors with 73,892 ha and 208,644 ha in Lao PDR and Cambodia, respectively (ODC data, Global Witness, 2013; Dwyer, 2015). We selectively focus on rubber sector investments due to dominant role that the sector plays in overall land acquisitions and, at least in the case of Lao PDR, the exponential growth in rubber latex exports seen over the last decade. The cases below—both of which may be accurately characterized as land grabs due

to their mode of establishment and impacts—illustrate the ways in which state concessions constitute an important pathway of displacement of deforestation from Vietnam. In both cases, we explore how impacts on forest may extend far beyond registered concession boundaries, a common pattern in Lao PDR and Cambodia (Hett et al., 2015; Petersen et al., 2016) while also providing timber resources for export to Vietnam. This suggests that impacted areas may be significantly higher than official concession inventories capture (Gaveau et al., 2017) while also pointing to the questionable legal basis of these land deals and the export of timber associated with them.

3.3.1. HAGL rubber plantation in Attapeu Province, Lao PDR

Beginning as a furniture manufacturer in Vietnam in 1990, HAGL quickly expanded vertically into the timber trade sector to provide resources for its production facilities (Forbes Asia, 2009). After making large profits in the Ho Chi Minh City real estate sector, the company began expanding into rubber, mining, and hydropower production in Vietnam. Faced with stringent domestic forest conservation policies in Vietnam, HAGL—which has only 2,394 ha of rubber plantations holdings in Vietnam⁵—increasingly looked outward, especially to Vietnam's near neighbors Cambodia and Lao PDR, for available land and forest resources to feed its growing industry (White et al., 2012). In 2010, HAGL was granted 10,000 ha of land-use rights by the Lao government to extract and export timber and establish rubber plantations in Attapeu Province, in exchange for their financial contribution to the construction of the Athlete's facilities for the 2009 Southeast Asian Games in Vientiane (Kenney-Lazar, 2012). In the years that followed, additional concessions were granted, eventually covering over 30,000 ha (Fig. 3). According to HAGL's (2010) annual report, the concession agreements included not only the right to produce and export rubber latex to Vietnam, but also the rights to 300,000 m³ of timber within the concession area, which would be used to supply their wood processing facilities in Vietnam.

Forest clearance for the plantation areas was carried out over subsequent years, causing a spate of land conflicts as, in several cases, village lands were cleared and subsumed into the company's expansive plantation area (Kenney-Lazar, 2012). Analysis of remotely-sensed imagery from 2008 (prior to the concession) and 2013 (when forest clearance for plantation was completed) indicates a 98% loss of forest area, or 30,594 ha, within plantation boundaries (Fig. 3), 8.7% of which (2715 ha) was inside national forest lands (National Protection Forest and National Production Forest), the remainder falling within community forest areas. The plantation itself extended well beyond the legally-allocated concession area (Fig. 4). Observational data collected by the Environmental Investigations Agency, EIA (2012) also suggests that selective logging for high-value timber was also carried out in adjacent areas.

3.3.2. VRG rubber concessions in Cambodia

VRG's concessions within two contiguous Wildlife Sanctuaries in Cambodia, Keo Seima and Snuol, show similar patterns of deforestation to the HAGL case above. Between 2009 and 2010, several adjacent rubber concessions were granted to Vietnamese and domestic companies within the Wildlife Sanctuaries (Fig. 5). In total, these concessions covered 83,669 ha, of which 45,993 ha were under the state-owned Vietnam Rubber Group (VRG) and other Vietnamese companies. That these concessions exceeded the legal threshold of 10,000 ha per company and were granted inside a protected area of national significance, led to the cancellation of VRG's concessions in 2010. In 2011, however, following interventions by the Vietnamese Embassy on behalf of VRG, the concessions were reinstated but reduced to 5000 ha each (Chhayli, 2012). While the reduction of concession areas within Keo Seima appeared to temporarily arrest forest clearance until 2014 (Fig. 5B.i and

⁴ Available online: www.openlandscape.info

⁵ <http://www.hagl.com.vn/AgriBusiness/AboutUs/6>

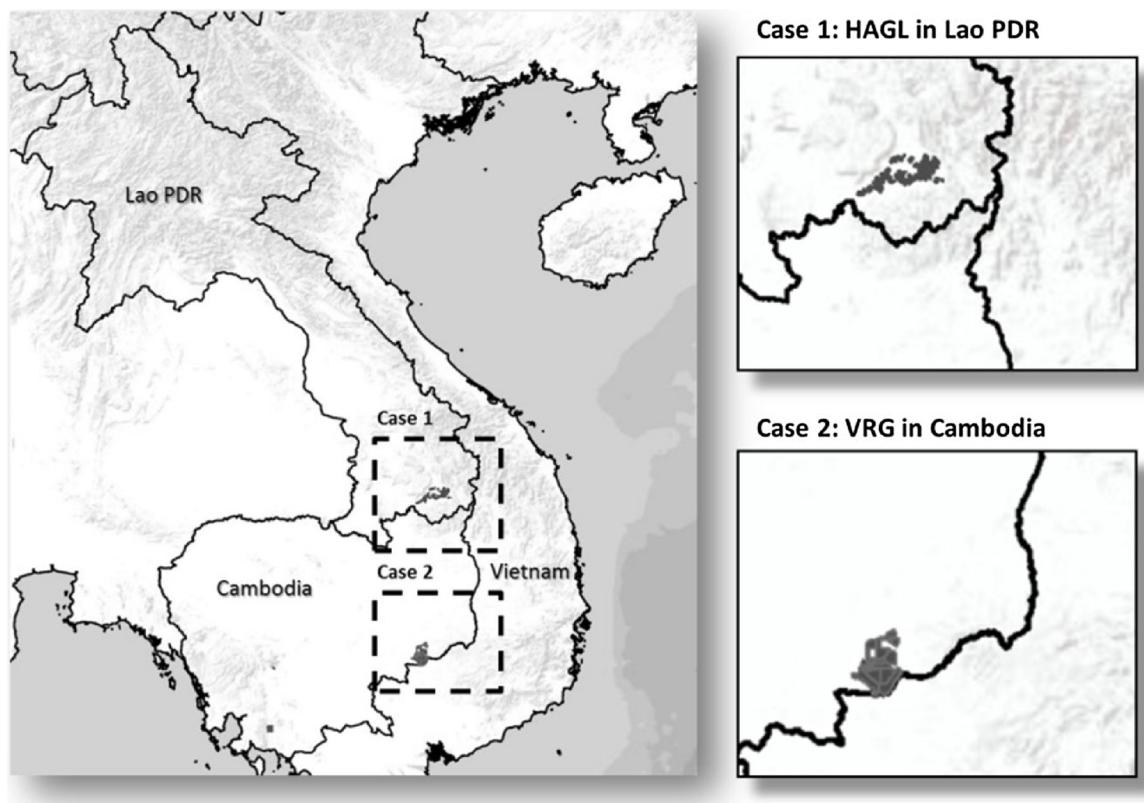


Fig. 2. Case studies context map.

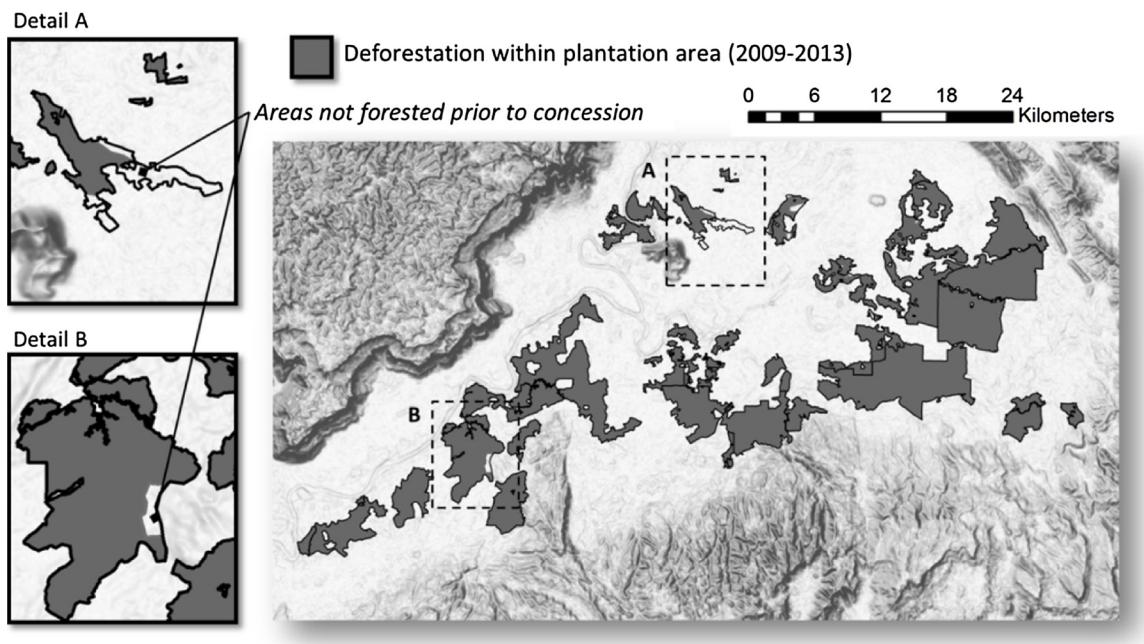


Fig. 3. HAGL case in Attapeu, Lao PDR.

Sources: CDE Land Concession Inventory data (2017), Landsat 8 (2008 and 2013).

ii), the entirety of the original concession areas was nevertheless cleared by 2016 (Fig. 5B. i* and ii*) from which timber was subsequently exported to Vietnam (Milne, 2015). Substantial areas in these Wildlife Sanctuaries outside of the granted concession areas were also cleared (Fig. 5B.iii), though the agents of deforestation cannot be reliably established. Exportation of timber from Keo Seima and Snuol continued until early 2018, resulting in violent engagement between

timber operators (backed by border security officials) and forest patrols on 30 January, resulting in the death of two forestry officials and one Wildlife Conservation Society staff member.

4. Discussion

We have highlighted two main mechanisms of displacement of

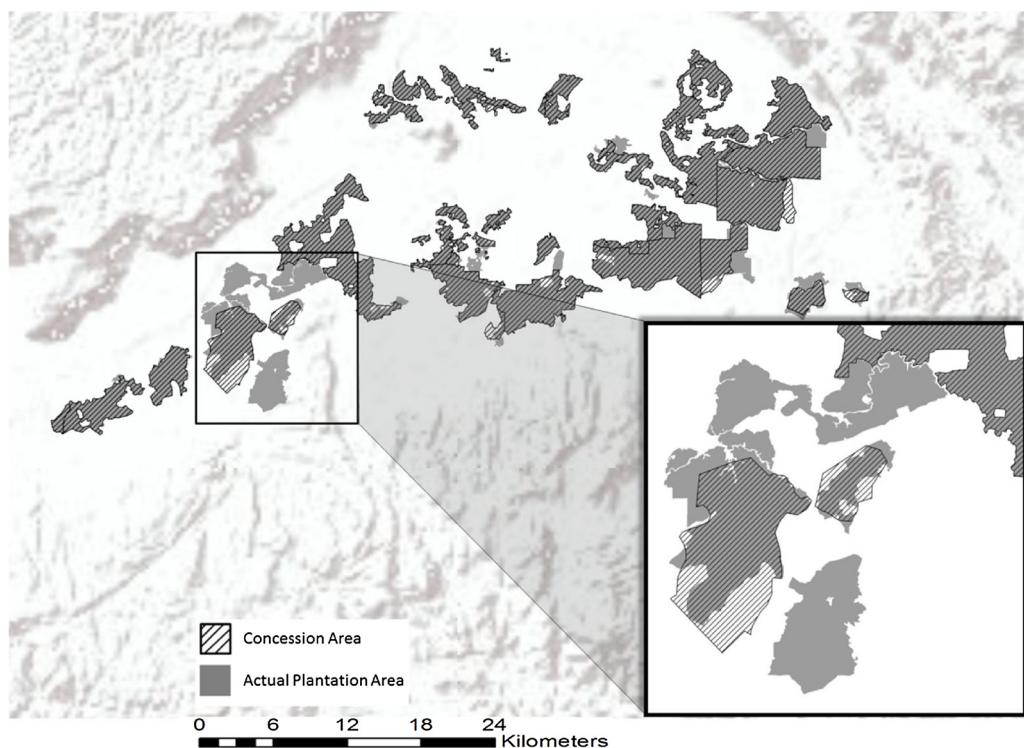


Fig. 4. HAGL Allocated Concession Areas Versus Actual Clearance and Plantation.
Sources: CDE Land Concession Inventory data (2017), Landsat 8 (2008 and 2013).

forest pressure: (i) a displacement of land use through the export of forest-risk commodities to Vietnam, and (ii) a geographical shift of Vietnamese companies to neighboring countries through LSLAs. These causal mechanisms are closely-related (LSLAs serve as important sites not only for geographic, or spatial, displacement but also as sources of forest-risk commodities), but they also operate independently. LSLAs may also serve other purposes, including stable financial investments. Further, while we here highlight the role of large-scale land concessions as a causal pathway linking forest use displacement, trade and the spatial impacts of these, there are other, possibly more subtle drivers associated with these dynamics that feature less prominently in the land-grabbing debate. Indeed, while commercial concessions represent a direct modality through which forest-risk commodities are secured for export, there are other—arguably less coercive—commercial arrangements with local producers such as outgrower schemes and contract framing, particularly in the agricultural sector. These may nevertheless have substantial and more difficult to quantify impacts on forest change and thus may constitute additional pathways for transboundary displacement of deforestation (Leisz et al., 2016; Friis and Nielsen, 2017).

The magnitude of the displacement of deforestation and forest degradation across international borders in the Mekong poses a substantial and immediate problem for REDD+. While the impacts of REDD+ in Vietnam are only beginning to emerge, the risks of incentivizing and rewarding the conservation of domestic forest carbon achieved at the cost of displacing deforestation and forest degradation—and by direct implication, forest carbon emissions—runs at cross-purposes with the goal of climate change mitigation. While it is assumed that transboundary displacement will be mitigated as REDD+ achieves global saturation, the case of Vietnam and the Mekong region suggests this should be viewed with skepticism. While both Lao PDR and Cambodia are in the preparatory stages of establishing National REDD+ Programs, progress on REDD+ has lagged considerably behind Vietnam suggesting that land and forest resources may remain open to displacement for a considerable time.

Beyond the delayed progress of REDD+ in Lao PDR and Cambodia,

nascent REDD+ strategies in themselves are also of concern. These strategies have focused on interventions to address forest emissions arising from small-holders and shifting cultivators—the ‘low-hanging fruit’—while avoiding the less-tractable issues of large-scale land concessions and other drivers that might threaten elite interests (Yeang et al., 2013; Ingalls and Dwyer, 2016; Vongvisouk et al., 2016). The national assessment of drivers of deforestation and forest degradation prepared for the Emissions Reduction Program Document (ERPD) did not explicitly include analysis of land concession data to assess potential impacts (GoL, 2018). Further, insofar as the large-scale acquisition of land displaces local communities onto other forest areas, driver analysis under REDD+ commonly misattributes these deforestation events to local communities and agriculture for subsistence and local markets, omitting the possibly indirect role of export-oriented commodity crop production, such as by migrants from the dominant ethnic groups (Meyfroidt et al., 2013a,b). This may function not only to direct attention away from transboundary land grabbing within REDD+ accounting, but also reproduce the historic degradation narratives that have marginalized local communities in forest governance (Ingalls and Dwyer, 2016; Ingalls, 2017).

This research also highlights some methodological problems relating to the causal attribution of deforestation and forest degradation to leakage (the displacement of carbon emissions induced by REDD+ policies and measures). While at the sub-national level leakage assessment is already notoriously complex, these complexities increase considerably when applied transboundary (Gan and McCarl, 2007). In part, this is due to the strong-leakage approach adopted by the UNFCCC wherein displacement of emissions must be directly—and demonstrably—attributable to emissions reduction measures (Henders and Ostwald, 2014) in order to be accounted for as “leakage”. This causal attribution is logically seen as a prerequisite for attributing responsibility in the context of REDD+, but it struggles with the practical reality that causal pathways are typically multivariate (Meyfroidt, 2016). LSLAs in Lao PDR and Cambodia are established both for timber extraction as well as for the commodities produced including rubber,

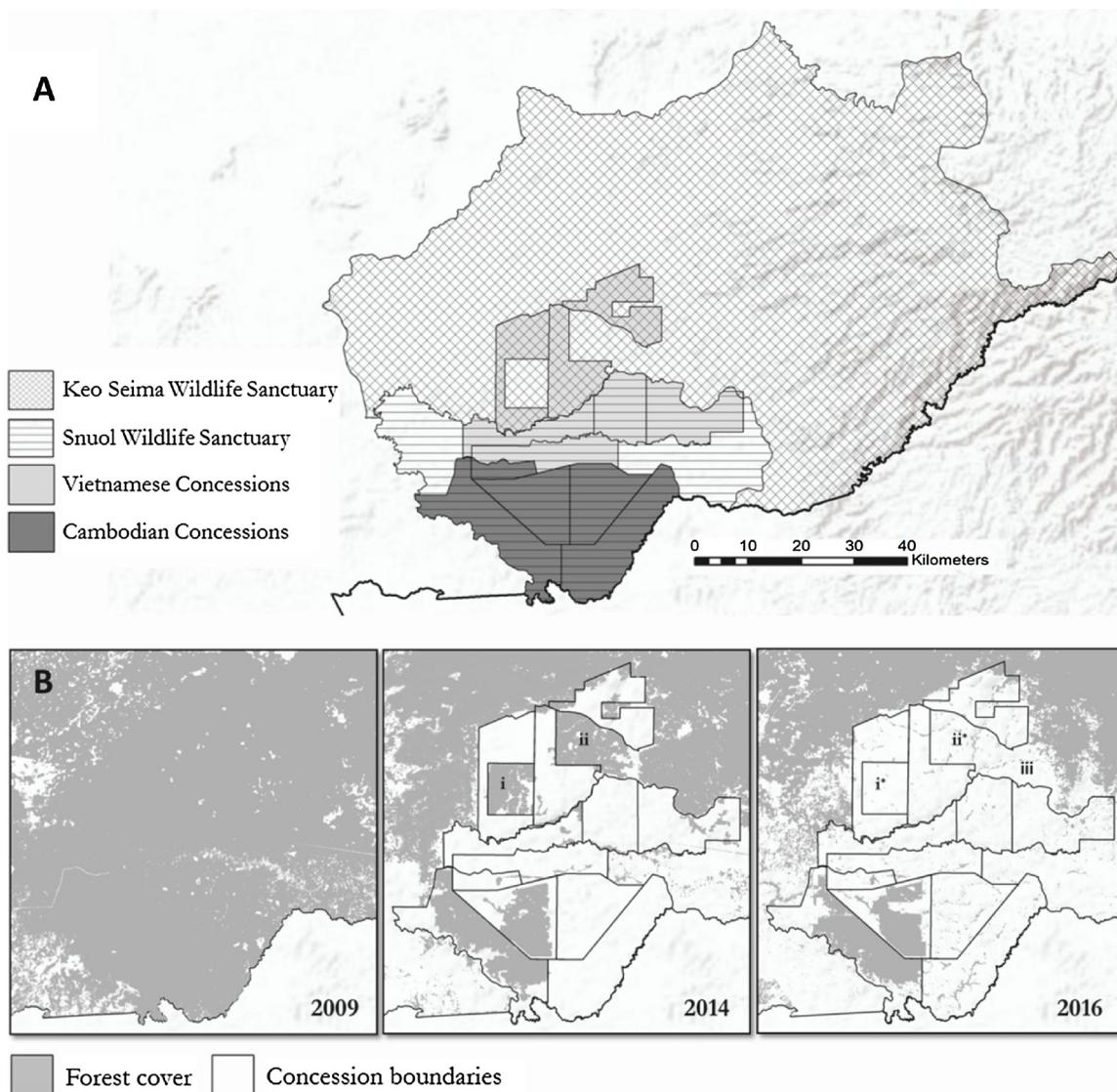


Fig. 5. VRG Case in Keo-Seima and Snuol Wildlife Sanctuaries, Cambodia.

Sources: ODC data (2017), 2009 and 2014 forest cover data provided by the Cambodian Forestry Administration, 2016 forest cover assessments from WCS.

agricultural, mining and other products. Attributing causality not only to the appropriate drivers but also to relevant social actors becomes more complex as these concessions play an important role in domestic development and national financing mechanisms. Properly disentangling the impacts of specific, causal drivers at play in deforestation events is a daunting, if possible, task. Even more difficult is the prospect of teasing apart the relative influence of push factors rooted in Vietnam's forest conservation policies (including REDD+) and the pull factors of market opportunities and global commodity trades. It is likely that a too-restrictive approach to biophysical accounting and causal attribution such as that established within the REDD+ mechanism will substantially underestimate the impact footprints of displacement and prevent from fully addressing this displacement.

Further, and with regard to the particular difficulties associated with forest replacement through rubber and other tree plantations, is the difficulties associated with the accepted forest definitions that are used as the basis for REDD+ accounting. While such concessions are classified as forests, their carbon values are substantially lower than natural forest areas in the Mekong region, as are their biodiversity and other ecosystem-service values (Ziegler et al., 2012). While REDD+ safeguards ostensibly preclude crediting atmospheric carbon removals from cases wherein rubber plantations replace natural forests, technical

limitations (and, arguably, lack of political will) for differentiating rubber plantations from natural forests and accurately establishing time-sequences for potential conversion events are notoriously difficult to capture.

4.1. FDI, Land grabbing and Mekong development pathways

While climate change mitigation and LSLAs are often treated as separate issues, our research echoes recent calls (e.g. Works and Wood, 2015) for bringing discourses surrounding these together to focus attention on the problematic ways in which they intersect. The scale and pace of macrostructural changes in land and forest governance regimes produced through international commodity flows and land grabbing throughout the Global South are large and apparently accelerating (Borrás et al., 2011; White et al., 2012). Land acquisitions in Lao PDR and Cambodia are largely driven by powerful corporate actors, commonly entail negative rural outcomes (e.g. Kenney-Lazar, 2010, 2012; MacLean, 2014; Jiao et al., 2015), at times prompt violent conflict (Schneider, 2011; Hunsberger et al., 2015; Works and Wood, 2015) and are in many instances clearly illegal (Global Witness, 2013). These land deals are also implicated in extensive systems of corruption and patronage that undermine potential public benefits and stymie regulatory

efforts (Ullenberg, 2009; Global Witness, 2013.). They are not, however, always characterized by violence and dispossession, nor are they always illicit. In the Mekong region, aspirations of economic development loom large in national discourses and policy. The core engine of these national development strategies are land and forest-intensive sectors, made explicit in Lao PDR's TLIC policies and similar strategies in Cambodia that have paved the way for concession-based development to produce forest-risk commodities for export. Despite their demonstrable negative social and environmental impacts, they are publicly legitimized on ground of the benefits these may bring to rural communities in terms of enhanced investments in the agricultural sector and wage-labor employment. Large-scale land acquisitions are intertwined with the export-oriented, FDI-intensive modes of development that have fostered unprecedented economic growth throughout in Mekong countries lacking critical domestic investment resources, even as the benefits of this growth have been unevenly distributed (Barney, 2011; Baird, 2011). Land is made available—and its expropriation by the state for concessions legitimized—through narratives that cast rural spaces in Lao PDR and Cambodia as resource frontiers, currently underutilized for 'mere' local subsistence (Barney, 2009; Schneider, 2011; Dwyer, 2015). The solution is presented as self-evident: much-needed FDI in land deals will leverage the latent productive potential of these spaces, turning them into engines of economic growth. In reality, these areas comprise not only the foundation of local subsistence, but also locally-owned commercial investments, whose prior claims and investments are made invisible by these narratives and erased through large-scale land transactions (Laungaramsri, 2012). There are alternatives. Insofar as development policy creates space for smallholders' involvement in export-oriented commodity crops production, FDI-related economic development can indeed deliver more pro-poor outcomes (Sikor, 2012), but in practice these benefits for local communities are seldom realized (Zoomers, 2010; Schneider, 2011). Further, these trade and investment relations may also be key variables in the geopolitical context of the Mekong, relating problematically to questions of state security and the balance of power between Vietnam and China (Ingalls et al., 2017). In recent years, REDD+ has shifted its emphasis from being a forest-conservation measure toward a more expansive, multisectoral intervention at the heart of a green economy and sustainable futures. Framed in such a way, REDD+ would appear adequate to grapple with the complex relations between forest carbon emissions, global commodity flows and structural dynamics of land and forest governance. Our research suggests that, in practice, this aspirational role of REDD+ may still be far off.

4.2. Intersections with FLEGT, land governance and other policy domains

The limitations in the design of REDD+ highlight the need for complementary approaches that explicitly engage with transboundary flows and related socioeconomic and political processes. Both land concessions and timber trade are beset by a number of issues relating to their degree of legality, suggesting a possible entry-point through national, bilateral and multilateral legislative reforms and law enforcement. Among such efforts, nascent programs in FLEGT and land governance reform loom large.

4.2.1. FLEGT

FLEGT-related measures are specifically focused on addressing transboundary relations between trade and impacts on forests, and have the potential to address both causal drivers of deforestation displacement we have identified here, including timber flows from LSLAs as well as those which derive from sector trade more generally. Insofar as timber acquired from clearing and selective logging is legitimized by concessions, addressing the legality of these timber flows to Vietnam may have a substantial impact not only on displacement associated directly with the timber trade but may also have ancillary effects on land conversion for other commodities where timber values serve as a

key incentive for land acquisitions. In 2016, the Government of Vietnam agreed to revise its long-standing position that timber imported legally constituted legal timber, regardless of source (see, for example, Petersen et al., 2016; Smirnov, 2015). Under the VPA negotiated with the EU Vietnam will now require assurance of legality at point of harvesting, a significant gain for addressing illegal timber flows. That Lao PDR is in the process of negotiating its own VPA with the EU may also signal progress toward mitigating the impacts of displacement. Indeed, drawdowns in timber exports to Vietnam during 2015 and, even more strikingly, in 2016 may presage a promising trend. While this shift is implicated in broader political changes in Lao PDR, FLEGT-initiatives have been a key trigger (Forest Trends, 2017). The significance of similar reductions in timber exports from Cambodia to Vietnam during 2016 remains to be seen (particularly in light of the 2017 uptick in exports), given a general lack of consistency in Cambodian legal reforms and fragmentation of policy implementation of import regulations in Vietnam between central government and provincial authorities. Despite these signals, there are at least three reasons for caution with regard to the broader effectiveness of FLEGT processes in addressing transboundary displacement. First, while the FLEGT-VPA process requires assurance of legality for all timber exports as defined by source countries and mandates the process through which legality definitions be formed, it does not prescribe their content (as these are subject to negotiation), leaving ample room for less-than-stringent legality definitions. Second, the vast majority of timber from Lao PDR and Cambodia does not enter the EU market, the principal focus of the VPA. While in principle the VPA in Vietnam covers the entirety of Vietnam's wood processing market, imports and exports, there is increasing pressure to limit its implementation to those products which will be exported to the EU. Political will for strict application of timber trade regulations is weakened by a loss of state revenue from reduced imports and local economic impacts resulting from drawdowns in Lao PDR and Cambodia wood supplies. A large proportion of timber from Lao PDR and Cambodia—especially high-value timber of questionable legality (To et al., 2015)—flows from Vietnam onward to China, a trade that has historically been intransigent to regulatory measures and law enforcement efforts. Significantly, China announced the closure of all its natural forests to timber extraction in 2016. The impact this may have on stimulating the China's market pull on regional timber resources is likely to be substantial (To et al., 2017), as are drivers associated with Vietnam continued ascendancy as a global wood processor, increasingly integrated with robust wood markets throughout the world. Third, drawdowns in timber imports from Lao PDR in 2015 were supplemented by increased flows from Cambodia, while drawdowns in timber imports from both countries in 2016 were largely replaced by African imports—which increased nearly 47% to a total of 933,789 m³ RWE (Vietnam Customs Data)—suggesting that these changes were driven by supply-side political measures rather than enhanced regulatory control in Vietnam. Vietnam has been generally reluctant to regulate its outgoing investments, preferring instead to put the onus on recipient countries. That Vietnam currently imports timber from more than 100 countries—providing an almost limitless landscape across which supply might shift in response to regulatory changes in source countries—shifts the onus back toward Vietnam's own political economy, implying the need for a regulatory environment robust to these multidimensional sourcing pathways as well as significant improvements in law enforcement capacity at all levels. This includes not only a firm commitment to requiring assurance of legal harvest for timber imports, but also more general regulatory measures to address outgoing investments that entail displacement effects relating to forest-risk commodities.

4.2.2. Land governance reform in Lao PDR and Cambodia

In both Lao PDR and Cambodia, national efforts to reform land governance and regulatory structures with regard to large-scale land investments are currently underway. While these efforts indicate some

positive movement toward addressing the impacts of transboundary investments on forests, their effectiveness in practice remains to be seen. In 2012, the Prime Minister of Lao PDR issued Order 13, calling for a moratorium on all new concessions pending government review of current concessions, their compliance with national law, effectiveness and impacts. Multiagency efforts supported by CDE to inventory all concessions and assess their positive and negative impacts across a number of domains represent a key starting point. These efforts are further complemented by legal reforms that include an overhaul of the 2003 Land Law. The 2012 moratorium, however, applies only a select number of sectors and largely for the purpose of evaluating the effectiveness of existing concessionaires, rather than a shift away from the assumption concession-based development as such. Further, the effectiveness of the moratorium has been limited: CDE-supported inventory data shows that more than 8,500 ha were granted for rubber concessions and a further 6.8 million ha granted for mineral exploration after the issuance of the moratorium. It is too early to tell how the Land Law revision will unfold, and with what implications for LSLAs. In Cambodia, the Prime Minister issued Order 01 in 2012, a moratorium on ELCs pending review of the current situation, along with an expansive land titling agenda covering over 700,000 parcels accounting for 1.2 million ha, some part of which were inside existing ELCs. While a number of questions remain regarding the quality of the titling process (carried out largely by student volunteers) Order 01 effectively led to the cancellation of 0.2 million ha of existing concessions. While Order 01 has largely been effective in halting new ELCs, new acquisitions through Social Land Concessions (that allocate land ostensibly for purposes of local development) and direct purchases of land arguably threaten to replace ELCs as mechanisms of LSLAs (Forest Trends, 2015).

Far-reaching and more effective governance reforms are therefore needed to address the transboundary impacts of Vietnam's investment on forests and to resolve persistent problems of marginalization of local communities. Perhaps the most tractable suggestion pertains to approaches that have advocated for Free, Prior and Informed Consent (FPIC)-related measures, such as the FAO-supported Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forestry in the Context of National Food Security (VGGT), endorsed by the Governments of Vietnam, Lao PDR and Cambodia in 2012 but not legally-binding. Given the large domains of illegality surrounding a number of concessions in Lao PDR and Cambodia related to local tenure rights, incorporating the principles of the VGGT and FPIC into national legislation may not only support benefits for communities but also help to mitigate displacement by ensuring compliance with local tenure claims. Absent of rigorous public debate on the potential costs and benefits of LSLAs, there are limitations here as well, particularly with regard to the degree to which impacted actors are "informed" (Dwyer, 2015). Whatever the potential benefits of regulatory reforms in the land sector, there is no reason to assume these will have a substantial impact on trade flows that operate independently of LSLAs, as global demand will likely continue to drive production and export.

4.2.3. Information and data transparency

The effectiveness of governance reforms aimed at mitigating transboundary displacement related to large-scale land concessions and the flow of forest-risk commodities is hampered by the persistent lack of available, reliable and government-accepted data and information. Analysis of resource flows and of land grabbing phenomena typically underestimate the amount of land in question, due in large part to the paucity of data available (White et al., 2012; Liao et al., 2016), undermining the prospect of firmly establishing causal relations between drivers of change and their impacts. When reported, the legibility of the information is further undermined by its fractured character, with key data housed in different agencies, classified and quantified according to different standards, and reported in different time intervals. Such lack of transparency with regard to land investments and financial flows limits our ability to get at these processes within time scales relevant for

analysis and the construction of effective interventions. This is partly due to a lack of capacity among government agencies, but may also reflect some intentionality insofar as opacity facilitates unaccountable governance (including patronage and corruption) and creates enabling conditions for business-as-usual. Efforts to improve data and enhance their visibility in the public domain is essential then, not only for properly accounting for complex causal relations in displacement but also the underlying conditions that enable displacement to occur, including those pertaining to land governance (Petersen et al., 2016; Gardner et al., 2018).

4.3. Expanding the frame of reference: global implications?

Efforts to address the illegal trade in timber through FLEGT-related measures, enhancing the regulation of large-scale land transfers, fostering more inclusive land- and forest-resource governance consistent with the VGGT and enabling a more transparent informational environment will nevertheless be limited absent of market demand sensitized to the transboundary impacts of commodity flows on forests. The global demand for forest-risk commodities is substantial and growing. While policy measures inducing domestic land scarcity in Vietnam demonstrably push land and forest-intensive commodity sectors into Lao PDR and Cambodia, deforestation pathways are also shaped by investments and commodity supply chains servicing other regional and global actors. Expanding the analytic frame on flows and land investments outward from Vietnam, for example, highlights the key role played by China in the region as the largest consumer of forest-risk commodities not only from Lao PDR and Cambodia, but also Vietnam. In 2016, Vietnam exported USD 32.9 billion in forest-risk commodities to China (UN Comtrade data, 2017). Conservatively focusing on the trade in timber and semi-processed wood from natural forests, there has been an average annual increase of 79.95% in exports from Vietnam to China since 2005 (Vietnam Customs data). Wood imports in 2016 increased substantially over 2015 figures, reaching 448,945 m³ RWE, about 220% of import in 2015. A large proportion of these imports were of wood from Lao PDR and Cambodia (To et al., 2015). Since China's (2016) logging ban, this trend is beginning to accelerate. Rubber and agricultural commodity sectors exhibit similar trends. Further, global financial investments in forest-risk sectors in Lao PDR and Cambodia—which involve Finland, Germany, Japan, South Korea, Switzerland and the United States (see Dwyer, 2015)—extend this network of impacts and responsibility far beyond China. The question—beyond our focus here—of 'who is responsible for deforestation in Lao PDR and Cambodia more generally?' might be answered quite differently within such a more expansive framing. The landscape across which supply of forest-risk commodities are financed, produced, and traded is global and complex, indicating that local measures to address displacement impacts may at best function to displace these pressures further onto other, more weakly regulated places. This suggests a need for other, demand-side measures—such as zero-deforestation pledges, certification schemes and others—to address social and ecological consequences of consumer demand (see Lambin et al., 2014; Henders et al., 2015) as well as more robust efforts to enhance public scrutiny of global investment flows. The global nature of these flows and impacts put some part of the onus for corrective interventions back onto global investors and consumers, including those in countries that have touted their own success in mitigating domestic carbon emissions and enhancing removals.

5. Conclusion

The impacts of the transboundary displacement of forest pressures from Vietnam to Lao PDR and Cambodia are substantial and have accelerated rapidly over the past decade. We have here explored key, inter-related causal mechanisms through which trade flows and land deals produce forest change within Lao PDR and Cambodia, illustrating

the risks associated with the fragmentary implementation of REDD+ across linked national economies and exposing important structural limitations of the REDD+ framework. These limitations have direct implications for the application of REDD+ as a global climate change mitigation strategy. The risks of transboundary displacement are increasing with globalization and the acceleration of resource flows. Further, these dynamics are complex, not only in their scope (relating to global trade flows and market demand) but also in the ways in which they intersect with key questions of national development and land-and forest-resource governance. Identifying appropriate interventions to address transboundary displacement of forest pressure thus requires a fine-grained analysis of the ways in which entwined drivers intersect in particular locations, and the ways in which drivers of land and forest change are legitimated. The illegality of many resource enclosures for forest-risk commodities provide entry-points for complementary approaches to mitigate impacts on forest across international borders, such as through bilateral trade mechanisms related to FLEGT. The virtually limitless landscape across which forest-risk sectors can access land and forest resources suggests, however, that bilateral approaches may be insufficient. The prospects for addressing global climate change mitigation may be significantly enhanced by pluristrategic approaches that bring together supply- and demand-side measures and the more rigorous application of land governance approaches that may maximize local benefits while alleviating forest carbon emissions.

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References

Baird, I.G., 2011. Turning land into capital, turning people into labor: primitive accumulation and the arrival of large-scale economic land concessions in the Lao People's Democratic Republic. *New Propos.: J. Marxism Interdiscip. Inq.* 5 (1), 10–26.

Barney, K., 2009. Laos and the making of the 'relational' resource frontier. *Geogr. J.* 175 (2), 146–159.

Barney, K., 2011. Grounding Global Forest Economies: Resource Governance and Commodity Power in Rural Lao PDR [PhD Thesis]. York University, Toronto, Canada.

Borras Jr., S.M., Hall, R., Scoones, I., White, B., Wolford, W., 2011. Towards a better understanding of global land grabbing: an editorial introduction. *J. Peasant Stud.* 38 (2), 209–216.

Branger, F., Quirion, P., 2014. Climate policy and the 'carbon haven' effect. *Wiley Interdiscip. Rev.: Clim. Change* 5 (1), 53–71.

CEBR, 2015. Economic Insight South East Asia, Quarterly Briefing Q3. Center for Economics and Business Research, Singapore and London.

Chhayli, Y., 2012. Letter to Prime Minister H.E. Hun Sen regarding Bin Phuc. Phnom Penh.

CDC, 2016. FDI in Cambodia. online: Council for the Development of Cambodia). <http://www.cambodiainvestment.gov.kh/investment-environment/investment-trend.html>.

Davis, K.F., Yu, K., Rulli, M.C., Pichdara, L., D'Odorico, P., 2015. Accelerated deforestation driven by large-scale land acquisitions in Cambodia. *Nat. Geosci.* 8 (10), 772–775.

Diepart, J.-C., 2015. The Fragmentation of Land Tenure Systems in Cambodia: Peasants and the Formalization of Land Rights. Technical Committee on Land Tenure and Development, Paris.

Dwyer, M.B., 2015. Trying to Follow the Money: Possibilities and Limits of Investor Transparency in Southeast Asia's Rush for "available" Land. CIFOR, pp. 177.

Dwyer, M.B., Ingalls, M.L., 2015. REDD+ at the Crossroads: Choices and Tradeoffs for 2015–2020 in Lao PDR 179 Center for International Forestry Research, Bogor.

EIA, 2012. Checkpoints: How Powerful Interest Groups Continue to Undermine Forest Governance in Lao PDR. Environmental Investigation Agency, London.

EIA, 2017. Repeat Offenders: Vietnam's Persistent Trade in Illegal Timber. Environmental Investigations Agency, London.

FAO, 2010. Global Forest Resources Assessment. Food and Agriculture Organization of the United Nations, Rome.

FAO, 2015. Global Forest Resources Assessment. Food and Agriculture Organization of the United Nations, Rome.

FIPD, 2015. Forest Resources Assessment. Forest Inventory and Planning Department, Ministry of Agriculture and Forestry, Vientiane, Lao PDR.

Forbes Asia, 2009. Condo Boss. 20 November..

Forest Trends, 2014. Forest Conversion in Lao PDR: Implications and Impacts of Expanding Land Investments. Policy Brief. Forest Trends, Washington DC.

Forest Trends, 2015. Conversion timber, Forest monitoring, and land-use governance in Cambodia. Forest Trends Report Series. Forest Trade and Finance, Washington DC.

Forest Trends, 2017. The impacts of Laos Log and sawnwood export bans. Forest Trends Report Series. Forest Trade and Finance, Washington DC.

Friis, C., Nielsen, J.Ø., 2017. On the system. Boundary choices, implications, and solutions in telecoupling Land use change research. *Sustainability* 9 (6), 974.

Gan, J., McCarl, B.A., 2007. Measuring transnational leakage of forest conservation. *Ecol. Econ.* 64 (2), 423–432.

Gardner, T.A., Benzie, M., Börner, J., Dawkins, E., Fick, S., Garrett, R., Godar, J., Grimard, A., Lake, S., Larsen, R., Mardas, N., McDermott, C., Meyfroidt, P., Osbeck, M., Persson, M., Sembres, T., Suavet, C., Strassburg, B., Trevisan, A., West, C., Wolvekamp, P., 2018. Transformative Transparency and a Deforestation Free Economy: How Supply Chain Information can Improve Supply Chain Governance and Sustainability. Submitted to World Development. Under revision.

Gaveau, D.L., Pirard, R., Salim, M.A., Tonoto, P., Yaen, H., Parks, S.A., Carmenta, R., 2017. Overlapping land claims limit the use of satellites to monitor no-deforestation commitments and no-burning compliance. *Conserv. Lett.* 10 (2), 257–264.

Global Witness, 2013. Rubber Barons: How Vietnamese Companies and International Financiers are Driving a Land Grabbing Crisis in Cambodia and Lao PDR. Global Witness, London.

GoC, 2011. Readiness Preparation Proposal (R-PP). Government of Kingdom of Cambodia and the Forest Carbon Partnership Facility, Phnom Penh.

GoL, 2010. Readiness Preparation Proposal (R-PP). Government of the Lao PDR and the Forest Carbon Partnership Facility, Vientiane.

GoL, 2018. Emissions Reduction Program Document: Lao PDR (Draft). Department of Forestry, Ministry of Agriculture and Forestry, Vientiane.

González-Eguino, M., Capellán-Pérez, I., Arto, I., Ansueggi, A., Markandya, A., 2016. Industrial and Terrestrial Carbon Leakage Under Climate Policy Fragmentation. No. 2016-02. .

HAGL, 2010. Annual Report. Available at. Hoang Anh Gia Lai Joint Stock Company. http://static2.vietstock.vn/data/HOSE/2010/BCTN/VN/HAG_BCTN_2010.pdf.

Hansen, M., et al., 2013. High-resolution global maps of 21st-century forest cover change. *Science* 342 (6160), 850–853.

Henders, S., Ostwald, M., 2014. Accounting methods for international land-related leakage and distant deforestation drivers. *Ecol. Econ.* 99, 21–28.

Henders, S., Persson, U.M., Kastner, T., 2015. Trading forests: land-use change and carbon emissions embodied in production and exports of forest-risk commodities. *Environ. Res. Lett.* 10 (12), 125012.

Hett, C., Nanhthavong, V., Saphangthong, T., Robles, G.R., Phouangphet, K., Epprecht, M., Heimann, A., Messerli, P., 2015. Land deals in Laos: first insights from a new nationwide initiative to assess the quality of investments in land Chiang Mai University, Chiang Mai, Thailand. Proceedings of the International Academic Conference on Land Grabbing, Conflict and Agrarian-Environmental Transformations: Perspectives from East and Southeast Asia 5–6.

Hoa, T.T.T., 2016. Rubber wood production in Vietnam Ho Chi Minh City, 14 December 2016. Wood Supply in 2017 Conference.

Hosonuma, N., Herold, M., De Sy, V., De Fries, R.S., Brockhaus, M., Verchot, L., Angelsen, A., Romijn, E., 2012. An assessment of deforestation and forest degradation drivers in developing countries. *Environ. Res. Lett.* 7, 044009.

Hunsberger, C., Corbera, E., Borras Jr., S.M., de la Rosa, R., Eang, V., Franco, J.C., Herre, R., et al., 2015. Land-based climate change mitigation, land grabbing and conflict: understanding intersections and linkages, exploring actions for change. MOSAIC Working Paper Series No 1.

Ingalls, M.L., 2017. Not just another variable: untangling the spatialities of power in social–ecological systems. *Ecol. Soc.* 22 (3).

Ingalls, M.L., Barney, K., Liao, C., 2017. Geopolitical dimensions of land systems governance in the Mekong: implications of political economic and securitization Bern, Switzerland, 3–5 September 2017. International Conference on Research for Development.

Ingalls, M.L., Dwyer, M.B., 2016. Missing the forest for the trees? Navigating the trade-offs between mitigation and adaptation under REDD. *Clim. Change* 136 (2), 353–366.

IPCC, 2007. In: Metz, B., Davidson, O.R., Bosch, P.R., Dave, R., Meyer, L.A. (Eds.), *Climate Change 2007: Mitigation; Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, UK/New York.

Jadin, I., Meyfroidt, P., Lambin, E.F., 2016a. International trade, and land use intensification and spatial reorganization explain Costa Rica's forest transition. *Environ. Res. Lett.* 11 (3), 035005.

Jadin, I., Meyfroidt, P., Pereira, J.C.Z., Lambin, E.F., 2016b. Unexpected interactions between agricultural and forest sectors through International trade: wood pallets and agricultural exports in Costa Rica. *Land* 6 (1), 1.

Jiao, X., Smith-Hall, C., Theilade, I., 2015. Rural household incomes and land grabbing in Cambodia. *Land Use Policy* 48, 317–328.

Kastner, T., Erb, K.H., Nonhebel, S., 2011. International wood trade and forest change: a global analysis. *Glob. Environ. Change* 21 (3), 947–956.

Keene, S., Walsh-Dilley, M., Wolford, W., Geisler, C., 2015. A view from the top: examining elites in large-scale land deals. *Can. J. Dev. Stud. Revue canadienne d'études du développement* 36 (2), 131–146.

Kenney-Lazar, M., 2010. Land Concessions, Land Tenure, and Livelihood Change: Plantation Development in Attapeu Province, Southern Lao PDR. National University of Lao PDR, Vientiane.

Kenney-Lazar, M., 2012. Plantation rubber, land grabbing and social-property transformation in southern Lao PDR. *J. Peasant Stud.* 39 (3–4), 1017–1037.

Kuik, O., 2014. REDD+ and international leakage via food and timber markets: a CGE

analysis. *Mitigation Adap. Strat. Global Change* 19 (6), 641–655.

Lambin, E.F., Meyfroidt, P., Rueda, X., Blackman, A., Börner, J., Cerutti, P.O., Dietsch, T., Jungmann, L., Lamarque, P., Lister, J., Walker, N.F., 2014. Effectiveness and synergies of policy instruments for land use governance in tropical regions. *Global Environ. Change* 28, 129–140.

Le Polain de Waroux, Y., Garrett, R.D., Heilmayr, R., Lambin, E.F., 2016. Land-use policies and corporate investments in agriculture in the Gran Chaco and Chiquitano. *Proc. Natl. Acad. Sci. U. S. A.* 113, 4021–4026.

Liao, C., Jung, S., Brown, D.G., Agrawal, A., 2016. Insufficient research on land grabbing. *Science* 353 (6295), 131.

Leisz, S.J., Rounds, E., Thi Bich Yen, N., Nguyen Bang, T., Douangphachanh, S., Ninchaleune, B., 2016. Telecouplings in the east–west economic corridor within borders and across. *Remote Sens.* 8 (12), 1012.

Lestrelin, G., Trockenbrodt, M., Phanvilay, K., Thongmanivong, S., Vongvisouk, T., Thuy, P.T., Castella, J.C., 2013. The Context of REDD+ in the Lao People's Democratic Republic: Drivers, Agents and Institutions, vol. 92 CIFOR.

Laungaramsri, P., 2012. Frontier capitalism and the expansion of rubber plantations in southern Laos. *J. Southeast Asian Stud.* 43 (03), 463–477.

MacLean, D., 2014. Laos' land grabs drive subsistence farmers into deeper poverty. *IRIN News* 22 (May).

MARD, 2016. MARD's Decision 3158, Dated 27 July 2016 Declaring the Country's Forest Status as of 2015. <https://thuvienphapluat.vn/van-ban/Tai-nguyen-Moi-truong/Quyet-dinh-3158-QD-BNN-TCLN-cong-bo-hien-trang-rung-2015-2016-321591.aspx>.

McElwee, P.D., 2016. *Forests are Gold: Trees, People, and Environmental Rule in Vietnam*. University of Washington Press.

McMichael, P., 2013. Land grabbing as security mercantilism in international relations. *Globalizations* 10 (1), 47–64.

Meyfroidt, P., Lambin, E.F., 2009. Forest transition in Vietnam and displacement of deforestation abroad. *Proc. Natl. Acad. Sci.* 38 (106), 16139–16144.

Meyfroidt, P., Rudel, T.K., Lambin, E.F., 2010. Forest transitions, trade, and the global displacement of land use. *Proc. Natl. Acad. Sci.* 107 (49), 20917–20922.

Meyfroidt, P., Lambin, E.F., Erb, K.H., Hertel, T.W., 2013a. Globalization of land use: distant drivers of land change and geographic displacement of land use. *Curr. Opin. Environ. Sustain.* 5, 438–444.

Meyfroidt, P., Vu, T.P., Hoang, V.A., 2013b. Trajectories of deforestation, coffee expansion and displacement of shifting cultivation in the Central highlands of Vietnam. *Global Environ. Change* 23 (5), 1187–1198. <http://dx.doi.org/10.1016/j.gloenvcha.2013.04.005>.

Meyfroidt, P., Carlson, K.M., Fagan, M.E., Gutiérrez-Vélez, V.H., Macedo, M.N., Curran, L.M., DeFries, R.S., et al., 2014. Multiple pathways of commodity crop expansion in tropical forest landscapes. *Environ. Res. Lett.* 9 (7), 074012.

Meyfroidt, P., 2016. Approaches and terminology for causal analysis in land systems science. *J. Land Use Sci.* 11 (5), 501–522.

Milne, S., 2015. Cambodia's unofficial regime of extraction: Illicit logging in the shadow of transnational governance and investment. *Crit. Asian Stud.* 47 (2), 200–228.

MPI, 2015. Statistics report. Ministry of Planning and Investment of Lao PDR. Available online at: <http://www.investlaos.gov.la/index.php/resources/statistics>.

Nally, D., 2015. Governing precarious lives: land grabs, geopolitics, and 'food security'. *Geogr. J.* 181 (4), 340–349.

Nguyen, VanDang, 2001. *Lam Nghiep Vietnam [Vietnam Forestry Sector]*. Agricultural Publishing House, Hanoi.

Nguyen, B.G., 2012. Cambodia-Laos-Vietnam development triangle: a viewpoint from Vietnam. In: Ishida, M. (Ed.), *Five Triangle Areas in the Greater Mekong Subregion*. Bangkok Research Center, IDE-JETRO, Bangkok, pp. 99–132.

Oxfam, 2016. Vietnamese Agricultural Investments in Cambodia and Laos: Benefits, Impacts and Challenges. Oxfam, Hanoi.

Petersen, R., Aksenen, D., Goldman, E., Sargent, S., Harris, N., Manisha, A., Esipova, E., Shevade, V., Loboda, T., 2016. Mapping Tree Plantations With Multispectral Imagery: Preliminary Results for Seven Tropical Countries. Technical Note. World Resources Institute, Washington, DC.

Pham, T.T., Moeliono, M., Nguyen, T.H., Nguyen, H.T., Vu, T.H., 2012. The Context of REDD+ in Vietnam: Drivers, Agents and Institutions (No. CIFOR Occasional Paper No. 75. Center for International Forestry Research (CIFOR), Bogor, Indonesia).

Schneider, A.E., 2011. What shall we do without our land? Land grabs and resistance in rural Cambodia. University of Sussex, 6–8 April 2011. Paper Presented at the International Conference on Global Land Grabbing.

Sikor, T., 2012. Tree plantations, politics of possession and the absence of land grabs in Vietnam. *J. Peasant Stud.* 39 (3–4), 1077–1101.

Smirnov, D., 2015. Illegal Logging Study, Lao PDR and Vietnam. CarBi Project: WWF Greater Mekong, Vientiane.

To, P.X., Mahanty, S., Dressler, W.H., 2015. A new landlord'(địa chủ mới)? Community, land conflict and State Forest companies (SFCs) in Vietnam. *For. Policy Econ.* 58, 21–28.

To, P.X., Quyen, Nguyen Ton, Hanh, Huynh Van, Huy, Tran Le, Cam, Cao Thi, 2016. Importation of Timber Materials from Lao PDR into Vietnam: Present Status and Future Trends. Vietnam Timber and Forest Products Association, the Handicraft and Wood Industry Association of HCMC (HAWA), the Forest Products Association of Binh Dinh (FPA Binh Djinh) and Forest Trends Hanoi.

To, P.X., Quyen, Nguyen Ton, Van Hanh, Huynh, Huy, Tran Le, Cam, Cao Thi, 2017. Sustainable development of the Vietnamese timber industry: removing high-risk import timber from the supply chain. Vietnam Timber and Forest Products Association, the Handicraft and Wood Industry Association of HCMC (HAWA), the Forest Products Association of Binh Dinh (FPA Binh Djinh) and Forest Trends. Hanoi.

TRD, 2017. The REDD Desk (Accessed online 17 October 2017) at.. TRD, Viet Nam. <http://theredddesk.org/countries/vietnam/financing?page=1>.

UNDP, 2010. Turning land into capital: maximizing the benefits for Lao PDR, some international perspectives National Land Management Agency, SDC, LIWG and UNDP, 7 October: Vientiane. United Nations Development Program Presentation, National Seminar on Turning Land into Capital.

Ullenberg, A., 2009. Foreign Direct Investment (FDI) in Land in Cambodia. Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH, Eschborn, Germany.

Vongvisouk, T., Lestrelin, G., Castella, J.-C., Mertz, O., Broegaard, R.B., Thongmanivong, S., 2016. REDD+ on hold: lessons from an emerging institutional setup in Laos. Asia Pacific Viewpoint.

Wells-Dang, A., Long, M.T., 2016. Chinese University of Hong Kong, 4–6 November. 'Vietnamese Cross-Border Agricultural Investments in Laos and Cambodia', Presentation by Oxfam in Vietnam at the Asian FDI Conference.

White, B., Borras Jr., S.M., Hall, R., Scoones, I., Wolford, W., 2012. The new enclosures: critical perspectives on corporate land deals. *J. Peasant Stud.* 39 (3–4), 619–647.

Wolford, W., Borras Jr., S.M., Hall, R., Scoones, I., White, B., 2013. Governing global land deals: the role of the state in the rush for land. *Dev. Change* 44 (2), 189–210.

Wong, G., Angelson, A., Brockhaus, M., Carmenta, R., Duchelle, A., Leonard, S., Luttrell, C., Martius, C., Wunder, S., 2016. Results-based Payments for REDD+: Lessons on Finance, Performance, and Non-Carbon Benefits, vol. 138 CIFOR.

World Bank, 2017. World Bank National Accounts Data, and OECD National Accounts Data Files (Accessed online 17 October 2017) at.. World Bank, Viet Nam. <https://data.worldbank.org/indicator/NE.EXP.GNFS.KD.ZG?locations=VN>.

Works, C., Wood, K., 2015. Intersections of Land grabbing and climate change mitigation strategies: Land and Resource conflicts 5–6 June 2015, Chiang Mai University. Conference Paper No. 83. Land Grabbing, Conflict and Agrarian-Environmental Transformations: Perspectives from East and Southeast Asia.

Yeang, D., Chapman, S., Scherchan, K., Dooley, E., Engbring, G., 2013. Introduction to REDD+ Governance in Cambodia. Briefing Paper of the Overcoming the Legal Barriers to REDD+ Implementation Project. Phnom Penh.

Ziegler, A.D., Phelps, J., Yuen, J.Q., Webb, E.L., Lawrence, D., Fox, J.M., Bruun, T.B., Leisz, S.J., Ryan, C.M., Dressler, W., Mertz, O., 2012. Carbon outcomes of major land-cover transitions in SE Asia: great uncertainties and Redd+ policy implications. *Glob. Change Biol.* 18 (10), 3087–3099.

Zoomers, A., 2010. Globalisation and the foreignisation of space: seven processes driving the current global land grab. *J. Peasant Stud.* 37 (2), 429–447.